2002 RAPTOR BREEDING SEASON REPORT

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Abstract: The 2002 breeding season was the 16th year of raptor monitoring at Pinnacles National Monument. Field observations began 11 January 2002 and ended 25 June 2002.

Pinnacles National Monument provides a diverse habitat for numerous cliff-nesting species as well as a spectacular array of summits and peaks for rock-climbers. Therefore, the behavioral and physical effect that climbers and off-trail hikers have on cliff-nesting raptors is studied.

The 2002 raptor-breeding season was successful, particularly for Prairie Falcons, *Falco mexicanus*. Twelve territories were occupied with eight active-breeding prairie falcon territories confirmed. Twenty-six prairie falcons hatched with twenty-two confirmed fledged. Two territories failed (one assumed by predation, one unknown), and one pair switched territories. Additionally, nine adult prairie falcons were captured, banded, and fitted with radio-tracking equipment for a research project on foraging habitat and patterns.

Golden Eagles, *Aquila chrysaetos,* were observed throughout the park. Several known nests were not occupied this year. One known nest off the park produced two eaglets.

STUDY AREA AND METHODS

Pinnacles National Monument (PNM) is located in the Gabilan Mountains of the central Coast Range of California. Elevation at PNM ranges from 244 to 982 m and covers 24,000 acres, or 9,713 hectares. The climate is Mediterranean with hot, dry summers and cool, damp winters. Temperatures range from a mean of 8.2˚ C in January to 22.6˚ C in July. The majority of the rainfall occurs from November to April with average yearly rainfall being 44 cm (National Oceanic and Atmospheric Administration, NOAA, 1997).

PNM provides a diverse range of habitat types for birds and other species. Wildlife occupies volcanic rock formations and outcroppings, California mixed chaparral, blue oak, live oak, and grey pine woodlands, grasslands, and riparian habitats.

Potential and established cliff-nesting raptor territories in high-use climbing areas of the park were surveyed using spotting scopes (15-45x) and binoculars (8x40). Observation spots were the locations that provided the best view of an eyrie or territory. A Garmin III Plus GPS unit was used this year to plot every observation spot. Surveys typically lasted 1.5 to 6 hours, depending upon the raptor behavior and amount of data collection needed. For a survey to be classified as "no birds" a minimum watch time of 5 hours was required. Territories were revisited on a 7-21 day schedule based on visitor use, the progress and age of raptors at territories (to obtain the most critical data for each territory for that time period), and the number of territories to be monitored. High visitor use areas were monitored more frequently and during weekend days when change in raptor breeding phenology could occur. While other groups estimate fledging success at 90% fledge age, our protocol is to end surveys once all young raptors are confirmed fledged. For a territory to be classified as unoccupied, a minimum of three surveys of "no birds" confirmed over three different months was required. Survey duration was ultimately dependent upon visibility. When birds cooperated and needed data was collected in short survey duration; nearby territories were visited as well.

In January, late afternoon and evening surveys were conducted to locate territorial prairie falcons. Perching, flying, diving, interacting, and roosting locations were sought as territorial behaviors and territory establishment. By mid-January climbing advisories went into effect and territories were monitored to record courtship behaviors, territorial disputes, and disturbance. Advisories were used to inform visitors of areas likely to have breeding raptors. Generally these areas were occupied by raptors at least once during the preceding three years. Visitors were advised to avoid these areas.

In late winter and early spring, mating was observed and counted in seconds. Food-swapping and eyrie selection was also recorded. Surveys during this period focused on evening and late-afternoon surveys until eyrie selections were made.

Incubation of nesting prairie falcons was determined by female prairie falcons flying into a nest hole and not reappearing for periods of time. Eggs were counted when possible by surveying when the best light was available for visibility and when food drops were made to the incubating female causing her to leave the nest temporarily. Soft-incubation, the first stage, was determined by a small number of eggs laid and the female incubating for short durations (15-75 minutes) unlike hard incubation with hours in duration. Surveys were done at early morning hours to catch early morning activities, such as food drops and to have a maximum amount of time for observation.

STUDY AREA AND METHODS continued-

Hatched young prairie falcons were aged by physical features using an aging guide (Moritsch 1983). Hatch date was determined by counting backwards from three independent agings.

Weather was always an important factor. During rain, temperature extremes, heavy fog or rain, most birds of prey were not active and therefore monitoring was not done during these patterns.

RESULTS

Prairie Falcons, *Falco mexicanus*

The first pair of prairie falcons was observed at Hawkins Peak on 11 January 2002. Twelve territories were occupied with all but one being previously used. Additionally, six of the eight eyries chosen by prairie falcons were also used before. The last pair formed before 4 April at D. Soto Canyon.

This new territory, D. Soto Canyon, was discovered east of the living quarters area at Chalone Creek Picnic Area. The pair chose an old stick nest in a canyon wall. However, four nestlings died presumably from predation. A small pile of fledgling prairie falcon feathers was found in the drainage below the eyrie with several broken feathers.

Several prairie falcons did not nest or produce young. A pair at Scout Peak was seen mating as late as 28 April 2002 but neither laid eggs nor chose an eyrie despite the female exhibiting nest-selection behavior. Singles at Tunnel and North Wilderness Rock territories also didn't produce eggs. Falcons at Dry Wall mated, a second male showed up and the first male left replaced by a banded bird caught at Balconies territory (see Discussion). No incubation was observed. A pair at Goat Rock nested in an old stick nest in a crack on the North face before failing in early May. The reason for failure is unknown. Two falcons were seen on South Chalone but it is not clear whether they were a new pair or North Chalone birds.

Incubation was first observed at Little Pinnacles at an early 19 March 2002; however, by estimation, the North Chalone birds would have been the earliest to begin incubation from 1-26 March. The first hatching occurred during a range of 7-9 April 2002 at North Chalone. The first fledging took place from 16-17 May 2002, also at North Chalone. The last young to fledge were the falcons at Willow Springs Slide and Hawkins Peak from 6-8 June 2002. This year set the park's record for early fledge dates (See Discussion). Twenty-six chicks were produced with 22 fledging. Eggs were successfully counted at five territories with a mean of 3.8 eggs per eyrie. Chicks were successfully counted at eight territories with a mean of 3.25 chicks per eyrie and 3.25 fledglings per eyrie.

This year, five male prairie falcons and four adult females were captured as part of a graduate research project through USGS, by former raptor monitor Shelley Buranek. Falcons were captured at five territories using a Great Horned Owl as lure and a dho-gaza net. The team collected data such as: length, tarsal length, primary feather length, mass, and a blood sample for DNA. All captured birds were outfitted with radio backpack transmitters with a life span of one year, and banded prior to release. The purpose of this auxiliary study is to better understand how the population of foraging prairie falcons relates to land uses on private lands surrounding PNM. Seven birds were caught late February to early March and two were caught prior to the fledge dates of their young (Table 1).

Table 1: 2002 PNM Prairie Falcon Nest Sites

Territory	Nest Used/ Last Year Used	Adult Captured: Sex	# Eggs Laid	# Young Hatched	# Known Young Fledged
Willow Springs Slide	WSS-1/ 1989	Yes. Female.	4	2	2
D. Soto Canyon	DS-1/ NEW	No.	5	4	0 Note: Predation.
Pig Canyon	PIG-6/ 1999	Yes. Male.	Unknown.	4	4
Little Pinnacles	LP-8/ 1999	No.	~2	2	2
Hawkins Peak	HP-1/ 1995	Yes. Female.	4	4	4
North Balconies	NB-5/ NEW	Yes. 2 Males and 1 Female.	Unknown.	4	4
Crowley Towers	CT-4/ 1998	Yes. Male/ Female.	Unknown.	2	2
North Chalone	NC-1/ 2000	Yes. Male.	4	4	4

Golden Eagle, *Aquila chrysaetos*

Golden Eagles were not observed nesting in PNM this year. There were sightings of golden eagles around Mt. Defiance and Frog Canyon; two adults and a juvenile were observed twice, once perched on power poles behind Dry Wall and another in flight not far from Mt. Defiance. Five former nests were observed in mid-winter and early spring and no new greenery had been added to any of the nests. The one confirmed eagle nesting occurred in the Eucalyptus Grove off PNM's West Side. Incubation was confirmed, and two young eagles were seen perched in the grove. Eagles were occasionally seen off the monument.

Red-tailed Hawk, *Buteo jamaicensis*

Many sightings of red-tailed hawks were recorded this year and a pair was seen nesting in a former prairie falcon eyrie on Citadel. No young were seen but the female was observed carrying a snake into the eyrie. Other red-tails in the park were seen near Park Headquarters and Goat Rock/Resurrection Wall. Former nests at Cemetery Gates and Western Front were not occupied this year.

American Kestrel, *Falco sparverius*

Kestrels were observed mating and nesting near South Balconies. Young were heard calling, but were not seen. A pair of kestrels also nested at Dry Wall. Territorial defenses against prairie falcons, ravens, and a merlin were observed. A pair and two offspring were also seen in the entrance meadow of the East Side of PNM.

Owls

There were no reports of owls nesting in PNM this season. Great Horned Owls, *Bubo virginianus*, were heard vocalizing not far from Chalone Creek Picnic Area, Chaos and Condor Crags area, South Balconies, and in the grove near the South Wilderness Trail. Western Screech Owls, *Otus kennicottii*, were heard near Chalone Creek Picnic Area. One Barn Owl, *Tyto alba*, was observed on the High Peaks trail below the oak woodland in a rock crack. No Long-eared owls, *Asio otus,* were reported seen nor heard.

Other Raptors

One pair of red-shouldered hawks, *Buteo lineatus,* was seen mating in the South Wilderness area not far from a previous nest and another near the meadow at the entrance to the park.

A white-tailed kite (or Black-shouldered), *Elanus caeruleus,* was seen over North Chalone and a few just off the East Side of PNM in a meadow.

A territorial sharp-shinned hawk, *Accipiter striatus*, pair was observed in the drainage and grove below the Resources office. The female was observed twice sitting atop a phone pole. An adult was also witnessed stooping on a small bobcat crossing the road to Bear Gulch Visitor Center. Another sharp-shinned hawk was observed perched upstream in a grove of willows at Willow Springs. It is highly likely that they nested there this year.

One light-morph Swainson's Hawk, *Buteo swainsoni*, was seen flying over North Chalone on 21 February 2002, possibly migrating north.

An adult merlin, *Falco columbarius*, was seen perched in a tree at the saddle overlooking North Wilderness Rock and Crowley drainage and another in the entrance meadow of the park.

Human Interactions

Climbers and off-trail hikers did an excellent job of heeding climbing advisories this year. No nesting prairie falcons were seriously disturbed nor witnessed displaying disturbed behavior. The advisory signs for raptor area closures and postings at climbing accesses seem to be effective. This marked the first year of full compliance for our raptor advisories.

One sonic wave was emitted from a blast site or landslide beyond Dry Wall; it left both pairs of prairie falcons at North Balconies and Crowley Towers wailing for a brief moment but both went back to regular activities.

On 11 May 2002, Ranger Wendy Artz and Raptor Monitor Ben Kinkade presented a campfire talk for Neotropical Migratory Bird day. The talk focused on required avian habitats and the raptor-monitoring program at PNM. The talk incorporated the park's first campfire Power Point slide presentation.

DISCUSSION/RECOMMENDATIONS

This year set a PNM record for earliest prairie falcon hatch and fledge dates. The earliest hatch date range for this year was 7-9 April 2002 at North Chalone. Fledge date range at North Chalone this year was 16-17 May 2002. A range of 10-12 April 1999 at Pig Canyon was the prior hatch date record. The previous record prairie falcon fledge date was 25 May 1999 and 25-26 May 2001, both at Pig Canyon. It is important to note that prairie falcon young have generally fledged in early to late June. This year all observed prairie falcon young fledged by or before 8 June. This moved fledge date up approximately two-to-three weeks from breeding season. Reasons for this early season may have been a result of record dry years in 2001 and 2002. Prairie falcons and other birds of prey may have started their season early while prey was abundant (Appendix 2: Prairie Falcon Nesting Phenology and Success chart).

The survey protocol in place for monitoring nesting raptors at PNM works well. My concern is the lack of Golden Eagle data I was able to gather. I highly recommend more training on eagle nesting habits and observation methodology for observing eagles as well as red-tailed hawks.

Afternoon and evening surveys are ideal in winter when determining where falcons will roost for the night helps locate potential eyries. Later in the season, early morning or evening surveys are recommended for getting detailed looks at birds, egg counts, or young. I found prairie falcons, and birds overall, to be most active from roughly 20 minutes before sunrise to approximately 1100 hours and then again at about two to three hours before sunset. However, this is dependent on temperature and weather. During the hottest, coldest, and wettest parts of the day, falcons were the least active. Morning and evening observations save the monitor from high temperatures and bad viewing conditions and provide unlimited amount of data to be recorded. I strongly recommend morning surveys.

Lists of nests and the best observation sites and times to watch from would be a helpful aid to future monitors. This year UTM coordinates were taken with a GPS unit at observation points and will aid future monitors in locating observation points.

The telemetry project provided foraging range and habitat data on prairie falcons and allowed me to keep tabs on the locations of tracked birds. One male captured at the Balconies territory later replaced a non-tracked male at Dry Wall territory. Banding the Hawkins Territory female allowed me to determine that the female at nearby Tunnel Territory was a different female. Provided this study continues into the future, capturing adult and young prairie falcons will allow for fewer errors in data when identifying falcons associated with certain territories as well as providing more insight into the range of the prairie falcon.

ACKNOWLEDGEMENTS

This project would not be as successful as it is without the eyes and ears of helpful PNM employees. Therefore, I would like to thank the park employees for their help and encouragement. The same could be said for our park visitors. Many hikers expressed appreciation for the work that I was doing for Pinnacles' Birds of Prey.

I could not have done this job as well without the instruction of Julie Rechtin. Her dedication and enthusiasm for Pinnacles' raptors is to be commended. I also thank my supervisor, Amy Fesnock, for her professional guidance and instruction. Biologist Paul Johnson, and Rangers: David Soto, Wendy Artz, and Neal Labrie all used their quick eyes and experience to give me observations on birds of prey on the monument. Shelley Buranek also provided me with insight on the program and unique information regarding the tracked falcons. I also thank Wendy Artz for assisting me with our campfire talk, and Interpretive Ranger, Richard Bañuelos, for his passion in demonstrating to the public how truly unique Pinnacles National Monument is.

Student Conservation Association (SCA) volunteers assisted me in the field as extra sets of helpful eyes. They were Katie Delaveaga, Chris Gorski, and Nathan Hartinger. Employees Michele Disney, Andrew Grant, and Rebecca Leonard also assisted in a survey, as did my parents, Jay and Harriett Kinkade, and relatives of Julie Rechtin.

Finally, I would like to thank employees Shauna Hee, Brant Porter, and Paul Johnson for their helpful editing on the initial drafts of this report!

REFERENCES

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APPENDIX 1

This season's full-time Raptor Monitor was Ben Kinkade, guided by Trainer Julie Rechtin and Park Biologist Amy Fesnock. Rechtin, Fesnock, and former raptor monitor, Ranger Wendy Artz, assisted in occasional team-watches at large territories. Several SCA students and park employee volunteers assisted me in the field as needed.

The total number of observation hours by staff was 742 hours. Volunteers' observation hours totaled 79. Total time in the field was 821 hours.